

ABSTRACT

A synthetic aperture system for producing a non-periodic pattern in a region of overlap. The system includes a source of electromagnetic radiation producing a plurality of electromagnetic beams, a plurality of beam controllers positioned to receive a respective one of the plurality of electromagnetic beams and direct the respective 5 electromagnetic beam into the region of overlap; and a system controller in electrical communication with each of the plurality of the beam controllers. Each beam controller controls at least one of the phase, amplitude and polarization of a respective one of the plurality of electromagnetic beams in response to control signals from the system controller. The result is a non-periodic pattern formed within the region of overlap by the 10 interference of a plurality of electromagnetic beams in response to the control signals from the system controller.

The invention also relates to a method for producing a non-periodic pattern in a region of overlap. The method includes the steps of providing a plurality of electromagnetic beams, directing the plurality of electromagnetic beams into the region of 15 overlap, and modulating at least one of the phase, amplitude and polarization of at least one of the plurality of electromagnetic beams to thereby form a predetermined non-periodic pattern in the region of overlap by the interference of the plurality of electromagnetic beams.